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WASHINGTON LETTER.

WASHINGTON, SEPT. 21, 1897.

SUMMER EXODUS.—During the summer months few matters of geographic interest transpire in or about the city of Washington, owing to the general exodus of scientific investigators and surveyors for remote fields of work. The chiefs and principal assistants of nearly all the scientific bureaux and offices have been actively engaged in field work or have removed their headquarters to points from which the work can be carried on under less physical discomfort than that experienced in the city. The far West, with its great opportunities, receives the attention of the larger proportion of Washington men, comparatively few of those engaged in geographic research remaining east of the Mississippi River.

The largest gathering of scientific men connected with Government work during the last season has been that at the American Association for the Advancement of Science at Detroit, and especially at the British Association at Toronto. At the latter men prominently connected with both the Canadian and United States bureaux of surveys presented results of recent investigations and discussed late advances in knowledge. Among the Washington geographers present were: General A. W. Greely, Chief Signal Officer, U. S. A.; Willis L. Moore, Chief of the Weather Bureau; W J McGee, Assistant Director of the Bureau of American Ethnology; Bailey Willis, Assistant to the Director of the U. S. Geological Survey, and Marcus Baker, Chief Cartographer of the same organization.

ASCENT OF MT. RAINIER.—In the course of the past summer it has happened that an unusually large number of the persons connected with the geographic or scientific work of the Government have extended their investigations into the State of Washington, and have availed themselves of the opportunities to ascend Mt. Rainier, or have enjoyed the facilities offered at the camp of the Mazamas. This mountain climbing club is composed mainly of residents of the Pacific Coast States. The object of the organization is “the exploration of snow peaks and other mountains, especially those of the Pacific Northwest, the collection of scientific knowledge and other data concerning the same; the encouragement of annual expeditions with the above object in view; the preservation of the

forests and other features of mountain scenery as far as possible in their natural beauty, and the dissemination of knowledge concerning the beauty and grandeur of the mountain scenery of the Pacific Northwest." The membership is restricted to those who have climbed to the summit of a snow peak acceptable to the society. Each year since its organization a camp has been established during a part of the summer as far up as possible on the side of some high mountain, from which explorations are made and an ascent to the top. Mt. Hood and Mt. Adams have thus been climbed and in 1896 Crater Lake visited. For this year Mt. Rainier was selected and the main camp established on July 25th on a high ridge beside Paradise Valley, up between the Cowlitz and Nesqually glaciers. The president of the organization, Mr. Henry L. Pittock, the first vice-president, Miss Fay Fuller, the secretary, Rev. Earle M. Wilbur, together with about 150 members and friends, made their headquarters at this camp, from it visiting various points on the mountain. The first ascent was made on July 27th, fifty-nine people—nine of whom were ladies—going to the top of the mountain. The climb was found to be more difficult than anticipated, even for experienced mountaineers, and the enjoyment of the outing was marred by several unfortunate accidents, the most serious and deplorable being the loss of life of Prof. Edgar McClure, of the Oregon State University. He had completed the ascent and was on the lower part of the snow-fields, having passed the relatively dangerous portion of the ascent. Shortly before reaching camp he and his companions missed the way, and on going to the edge of a steep slope to investigate he slipped, being dashed upon the rocks below, and instantly killed.

RESEARCHES IN NEW MEXICO AND ARIZONA.—The field work of the Bureau of Ethnology has been continued during the summer by examinations of the ancient pueblos. In the vicinity of Snowflake and of Pinedale, Arizona, Dr. J. Walter Fewkes has found ruins rich in prehistoric material and has obtained much valuable material for the collections of the Smithsonian Institution.

In New Mexico Mr. F. W. Hodge made a careful examination of the Mesa Encantada, about three miles northwest of the pueblo of Acoma. This has especial importance from the fact that many of the traditions of the pueblo Indians cluster about this almost inaccessible table-land. So far as can be ascertained, it has not been visited within the historic period either by Indians or by white men, but tradition relates that it was formerly inhabited and that communication was cut off by the falling, or washing away during

a cloud-burst, of portions of the vertical sides. Mr. Hodge, upon examination, found evidences of the ancient trail leading up on the west side to the mesa nearly obscured, hand holes being noted in the crevice through which the ascent was made up the cliffs. In the talus many fragments of pottery were found, these having a decoration and finish superior to that of the present time. On reaching the summit of the mesa fragments of weather-worn pottery were discovered, also a piece of a shell bracelet and portions of stone implements, with other evidences of human occupation. No remains of houses were found on the wind-swept summit, and it is probable that if adobe structures had existed there that they have been completely destroyed and blown away during occasional storms. The material found bears out, in part at least, the traditions of the natives and serves to strengthen the confidence which may be had in the statements handed down from father to son through many generations.

A few weeks before Mr. Hodge's visit, the mesa was ascended on the eastern side, where the wall is nearly vertical, by Prof. William Libbey, of Princeton, N. J.

MINERAL RESOURCES OF ALASKA.—The various exploring parties that have visited Alaska from time to time have brought back reports of the mineral wealth of the region, but a systematic examination is yet to be begun. An appropriation of \$5,000 was made to the Geological Survey for the fiscal year 1895-96, the same sum being appropriated for each of the succeeding years. Under the first appropriation Dr. George F. Becker, assisted by Mr. C. W. Purinton, began an investigation of the gold deposits of Southern Alaska. With Dr. Becker's party was Dr. W. H. Dall, who was placed in charge of the examination of the coal resources. The amount available was so small that instructions were given not to attempt to penetrate into the interior, but to confine the work to the vicinity of the shore and to the easily accessible islands. In pursuance of this plan an examination was made of the celebrated Treadwell mine on Douglas Island, near Juneau, and of other workings in the vicinity. It was found that this mine was in slates of comparatively recent sedimentary origin, probably of Triassic age, penetrated by a heavy dike of diorite or similar basic rocks. Both the slate and the diorite were ruptured along the zone, which in places is several hundred feet in width, the spaces being filled with ore. This averages only from \$2.50 to \$3.00 per ton, but owing to the enormous quantities available there is great profit in working it.

In the vicinity of Juneau there were found to be a number of areas from which gold has been obtained. The nearest of these, the Silverbow Basin, is about three miles north of east of Juneau. Small veins of rich ore are found on the south side of the basin. This was formerly occupied by a glacier which, retreating, gave rise to a lake in which auriferous gravel was deposited. This is now being worked by hydraulic processes. The same series of quartz veins extend to Sheep Creek Basin, not far distant. About fifty-five miles southeasterly of Juneau are mines at Sumdum, and about fifty miles to the north of Juneau at Seward are also auriferous veins, as well as on Admiralty Island, about thirty miles away.

The sands of the beaches to the eastward of Mt. St. Elias are in places auriferous, and the ease of handling, together with the practically unlimited supply of sand, have rendered the working of this material very attractive, but the difficulty of saving the gold and the irregularity of distribution of rich deposits render the operations rarely successful. There is undoubtedly an enormous amount of gold in these sands, but the profits have been small. Stream gravels are also being worked at the head of Cook Inlet.

On one of the islands of the Shumagin group is a large amount of ore which is stated to average from \$8 to \$9 per ton. This occurs in a crushed area of andesite. It is being worked by the Apollo mine, which is stated to yield at the rate of over \$300,000 a year. Auriferous quartz has been found on other islands and the gold-bearing sands and gravels are reported from many localities. For the successful carrying on of mining operations, especially on a large scale, an abundant supply of fuel is essential. Fortunately this is to be found easily accessible for marine transportation. Large fields of fairly good brown coal exist on the eastern shores of Cook Inlet, and veins have been found on the south shore of the Alaskan peninsula. No anthracite coals have been found, but the beds so far opened have considerable value for manufacturing operations.

The second year's reconnaissance—that of 1896—was conducted by Mr. J. Edward Spurr, with two assistants, Messrs. H. B. Goodrich and F. C. Schrader. They penetrated into the interior, crossing the headwaters of the Yukon by the Chilcoot Pass, following Forty Mile Creek down to the river. There they entered upon the gold-bearing forms and made a reconnaissance of an area of upwards of 30,000 square miles. The observations were continued on both sides of the Yukon from the boundary of British Columbia down as far as Nulato. From thence a river steamer conveyed the

party to St. Michael. A preliminary report of this reconnaissance was made on February 3, 1897. The full report, with accompanying maps, is now in type as one of the papers of Part III. of the Annual Report of the Geological Survey.

Placers of the tributaries of the Yukon, as well as those along the main stream, were carefully studied. The source of the gold was traced to the solid rocks, and the general character of these was for the first time made known. The gold-bearing rocks were found to occur in a definite belt for several hundred miles in Alaska, extending from the International Boundary to the Lower Ramparts of the Yukon. Within this gold occurs in quartz veins often associated with pyrite, the ores being usually of low grade. Ores of silver and lead were found in a number of localities and small quantities of copper were noted, the latter being conspicuous by its green stains. Coal also was found not far from the gold-producing district.

The third appropriation of \$5,000 was made in the Sundry Civil Act for the fiscal year 1897-98, but this act became a law so late in the season that it was not deemed expedient to attempt to send a party to Alaska to continue the examinations during 1897, but it is hoped that it will be practicable to do so early next spring.

The report of Mr. Spurr now being put into type contains a map of Alaska showing the route traversed by the party in 1896, also a geological map of the Yukon gold-field, and a number of other maps of mining areas. There are also many views and sections illustrating details of the geography and geology of the area. A description is given of the history of the Yukon gold district and a discussion of the general geology of the country. These are followed by a description of the igneous rocks and of the probable movements of the earth's crust. The valuable metals in the solid rocks are taken up and a description given of the placer deposits and of the methods of mining.

All of the gold produced in Alaska is alloyed with a small quantity of silver. Native silver is frequently found and also native lead and copper. Platinum also has been reported from several localities. Tiny flakes or colors of gold are found widely distributed in the sands and gravels of many rivers, much of it having travelled for many miles. In the workings where the gold is comparatively abundant and coarse it is apparent that the source is relatively near. For example, on Forty Mile and other creeks, the bars were, as a rule, richer than those on the Yukon, into which these streams flow. Prospectors, by following up these streams

and finding richer accumulations, have finally penetrated into gulches where fragments of quartz are found in the nuggets of gold, indicating that these have travelled but a short distance. In this way they have come upon the quartz ledges or vein material. The river gravels themselves are often nearly barren, except at the bottom, in what is known as the "pay dirt." This averages usually less than 2 feet in thickness, while the overlying gravels may be from 8 to 10 or even up to 25 feet in thickness. The present methods of working are so crude that only the richest of the gravels are worked, quantities being thrown aside which ultimately may yield large returns by the use of better appliances.

CENSUS OFFICE.—The publication of Part III. of the Compendium of the Eleventh Census, giving miscellaneous statistics, practically brings to a conclusion the results of the work of that bureau. There has already been given on pages 416 and 417 of Vol. XXVIII. of this BULLETIN a statement of the volumes pertaining to the census, nearly all of these being now in the hands of the public, the principal exception being the statistical atlas—a work requiring considerable time in printing owing to the large number of maps and colored diagrams. The Eleventh Census, as such, has been abolished, the few remaining clerks being organized into a Census Division of the office of the Secretary of the Interior; provision being made merely for the care and preservation of the records.

The third volume of the Compendium brings together in accessible form many of the more important facts scattered through a dozen or more huge quartos. It summarizes the population of the country, showing the State or Territory of birth, the foreign parentage, conjugal condition, ages, illiteracy, occupations, and the number of soldiers and widows. The larger details of agriculture and manufactures are also dealt with, as well as those of fisheries and transportation. The figures of wealth, debt and taxation are summed up and also those of real estate mortgages, while the ownership of farms and homes is placed in a relatively condensed space.

One of the most prominent facts shown by the Compendium is that over 85 per cent. of the population was born in this country. Of this number over three-fourths were born in the State or Territory where they were living at the time of the enumeration. This is remarkable, considering the shifting character of our people, especially in the Western and newer States. As regards parentage, it was found that there were over twenty million persons whose father or mother was born abroad; out of this twenty million, how-

ever, a little over one-half were born in this country; so that there were found to be only about nine million persons coming from beyond the limits of the United States. The largest proportion of persons of foreign parentage is in the northern half of the United States, where nearly one-half of the population consists of persons whose father or mother was not a native of this country. As regards States, North Dakota comes first with 79 per cent. of the population of foreign parentage, while next to this in order come Minnesota and Wisconsin, with about three-fourths of the population of foreign extraction. The smallest percentage is found in the States of North and South Carolina and Georgia.

As regards the country of origin Germany comes first, having supplied nearly seven million individuals, or over one-third of the total number of those of foreign extraction. Ireland comes next, with nearly five million, or about one-fourth of the foreign population. All of the other countries contribute relatively small numbers, England being the most notable, with less than ten per cent.

The statistical inquiry as regards soldiers and widows was a novel feature, and one which was not fully completed as planned, the materials being finally turned over to the Pension Office. It was found, however, that there were living a trifle over one million United States soldiers, sailors, and marines, and a little less than one-half that number of Confederates. Of the United States veterans over one-half were between 45 and 54 years of age and about one-fourth between 55 and 64 years of age. The Confederate veterans, as a class, were somewhat older than the United States veterans. The widows of United States soldiers, sailors and marines numbered 145,000. From the returns of the Pension Office it appears that about nine-tenths of the Union veterans and widows are receiving more or less support from the Government.

The total expense of the Eleventh Census has been ascertained to be a little over eleven and one-half million dollars. Of this amount it has been estimated by the Commissioner in charge that two millions could have been saved, had the clerical force been organized at an early date and continued under the operation of Civil Service rules. Enormous losses in salary and in general efficiency were brought about by the changes in the *personnel* of the office, experienced clerks being displaced from time to time to make room for new and unskilled persons. The maximum force at any one time was 3,119, but in the aggregate a far greater number were employed, owing to this shifting about. Another two million dollars could have been saved by omitting a number of investigations

which could have been carried on as well, or better, by other bureaux of the Government. In order to obviate this great waste of money and loss of time, various statisticians have urged Congress to pass a bill for the Twelfth Census, so that, at least, a small force of experts might be trained, and plans made for systematically carrying forward the enumeration. The efforts in this direction were, however, futile, as the recent extraordinary session of Congress adjourned without taking action.

AGRICULTURAL STATISTICS.—One of the most important of recent changes in the scientific bureaux of the Government has been the appointment of a new statistician of the Department of Agriculture. The new appointee is Mr. John Hyde, of Nebraska, formerly expert special agent in charge of agricultural statistics for the last census. His training in this and in other investigations of like character, together with his thorough knowledge of the geography of the country and all its resources, render him peculiarly fitted for the place. The results of the operations of the Division of Statistics are among the most far-reaching of the actions of the Government. Over one hundred thousand people contribute periodically to the results, and its monthly statements are given the widest possible publicity, being printed in copies aggregating millions. While the force at Washington comprises only about 80 persons, yet these receive and tabulate statements sent in by about 140,000 farmers distributed in every county of the United States, and selected, as far as possible, because of their experience and superior intelligence. In addition, statements are obtained from 10,000 county crop reporters, and from 15,000 or more township correspondents, as well as from an approximately equal number of millers and dealers in agricultural products. The marshalling of this vast army of estimates and condensation each month of the results into a few sentences or paragraphs such as to give a true statement of crop conditions of the United States is one of the unique features of Government work. Upon the hour that the crop report is to be given out, a small army of telegraph operators and special messengers stand ready to receive the brief sentences, transmitting them with the utmost rapidity to every point of the country and sending them abroad. Within a few hours, or even minutes, hundreds of printing presses from Maine to California are striking off innumerable copies of the official statement. Affecting, as it does, the property of millions of farmers, as well as the operations of thousands of dealers and speculators, the utmost care and accuracy is demanded and conclusions are at all times subjected to the most severe criticism.

GEOLOGICAL SURVEY.—The report of the Director for the last year has been transmitted in five parts. Of these Nos. 1, 4 and 5 are in type, but have not been printed, owing to delays incident to the preparation of maps and illustrations. The total report will probably comprise very nearly 4,000 pages, and will require six and possibly seven volumes, some of them being almost unwieldy in size. The Survey has reached that point in its development where many investigations carried on through years are now yielding results, and great difficulty is experienced in finding means of publication.

The first part of the report consists of the statement by the Director, showing the progress of all of the branches and divisions of the organization. With this is a lengthy appendix, giving the details of triangulation and spirit leveling. The year 1896-97 was the first during which bench-marks have been systematically established, this operation being required by the following paragraph in the appropriation bill:

That hereafter in such surveys west of the ninety-fifth meridian elevations above a base-level located in each area under survey shall be determined and marked on the ground by iron or stone posts or permanent bench-marks, at least two such posts or bench-marks to be established in each township or equivalent area, except in the forest-clad and mountain areas, where at least one shall be established, and these shall be placed, whenever practicable, near the township corners of the public-land surveys; and in the areas east of the ninety-fifth meridian at least one such post or bench-mark shall be similarly established in each area equivalent to the area of a township of the public-land surveys.

These lines of level in nearly all cases were run in circuits of from 40 to 80 miles, the limiting error of closure being relatively small. The results are permanently stamped to the nearest foot on bench-marks, consisting either of wrought-iron posts 4 feet long, placed firmly in the ground and having on the upper end a bronze tablet, or of similar tablets or copper plugs inserted in stone foundations of buildings or bridges, or in natural rock surfaces.

During the year 10,480 miles of spirit levels were run, resulting in the establishing of 1,820 permanent bench-marks in 26 States and Territories. The average cost of the leveling was \$4.75 per lineal mile, this being equivalent to \$1.40 per square mile of area topographically mapped. Topographic surveys were extended over 27,466 square miles, this being within 25 States and Territories. The average cost of the topographic mapping, including the leveling, was \$4.60 per square mile.

Up to the present time, one-quarter of the total area of the United States, exclusive of Alaska, has been covered by the topo-

graphic surveys, these having been conducted in every State and Territory except Indiana, Mississippi and Ohio. The percentage of each State covered varies from 100 in the cases of Connecticut, District of Columbia, Massachusetts, New Jersey and Rhode Island, to 1 per cent. in Minnesota, 3 per cent. in Florida and Michigan, and 4 per cent. in Washington.

TOPOGRAPHIC MAP OF NEW YORK.—In the State of New York, where topographic mapping is being carried on by the U. S. Geological Survey in coöperation with the State Engineer and Surveyor, 2,570 miles were surveyed in 1896-97, this making a total of 13,314 square miles, or 27 per cent. of the entire area of the State.

The results of the topographic work in New York up to the present time are shown by 80 atlas sheets, of which 15 are still awaiting publication. The sheets latest completed are: Newcomb, Thirteenth Lake and Indian Lake, these areas being included in Essex, Hamilton and Warren counties; also the Utica, Skaneateles, Moravia and Auburn sheets, covering Oneida, Herkimer, Onondaga, Cayuga, and Tompkins counties; also the Olean, Lockport, Medina, Albion, Olcott, Ridgeway, and Oak Orchard sheets, showing areas in the Counties of Orleans, Genesee, Niagara, Erie, Cattaraugus and Alleghany. In connection with this work, 925 miles of spirit levels were run and 105 permanent bench-marks established.

DEEP WATERWAYS COMMISSION.—In the act making appropriations for sundry civil expenses of the Government for the year ending June 30, 1898, an appropriation was made for a Deep Waterways Commission in the following words:

For surveys and examinations (including estimate of cost) of deep waterways and the routes thereof, between the Great Lakes and the Atlantic tide waters, as recommended by the report of the Deep Waterways Commission transmitted by the President to Congress January eighteenth, eighteen hundred and ninety-seven, one hundred and fifty thousand dollars. Such examinations and surveys shall be made by a board of three engineers, to be designated by the President, one of whom may be detailed from the Engineer Corps of the Army, one from the Coast and Geodetic Survey, and one shall be appointed from civil life.

The engineers designated by the President are, Major T. W. Raymond, U. S. Army, Alfred Noble of Chicago, and George Y. Wisner of Detroit. The board was organized in the latter part of August and now has a field party at work on the survey of the line from Tonawanda to Olcott by way of Lockport. Preparations are being made to begin observations of the discharge of Niagara River at Blackrock, the immediate direction of this work being

placed in the hands of Mr. E. E. Haskell. Plans have been made for beginning the Oswego-Oneida-Mohawk survey at the earliest practicable opportunity.

The report of the Deep Waterways Commission transmitted to Congress January 18th, 1897, to which reference is made in the act of appropriation, has recently been printed and contains all of the available information relating to the geography and hydrography of the proposed routes from the Great Lakes to outlets to the ocean. Through the energy and perseverance of Mr. Lyman E. Cooley, the engineer of the board, a surprisingly large amount of data has been brought together, much of it from obscure sources.

N.